SEQUENCE LISTING

<110> Beraud, Christophe
        Craven, Andrew
        Yu, Ming
        Sakowicz, Roman
        Patel, Umesh A.
        Davies, Katherine A.

<120> NOVEL MOTOR PROTEINS AND METHODS FOR THEIR USE

<130> 020552-001410US

<140> US 09/883096
<141> 2001-06-15

<150> US 09/594,655
<151> 2000-06-15

<160> 6

<170> PatentIn Ver. 2.1

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<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleic acid sequence of human kinesin motor
        protein gene HsKip3a (Figure 1).

<220>
<223> Description of Artificial Sequence: HsKip3a gene.

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cgaggcggcc acccaacagg acgtgttcca gcacaccacg cacagcgtcc tggacagctt 420
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<210> 2
<211> 864
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence encoded by human kinesin motor
     protein gene HsKip3a (Figure 1).

<220>
<223> Description of Artificial Sequence:Amino acid
     sequence of HsKip3a.

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Pro Thr Pro Arg Glu Leu Asp Ser Gln Arg Arg Pro Val Val Gln Val
            20                  25                  30

Val Asp Glu Arg Val Leu Val Phe Asn Pro Glu Glu Pro Asp Gly Gly
        35                  40                  45

Phe Pro Gly Leu Lys Trp Gly Gly Thr His Asp Gly Pro Lys Lys Lys
    50                  55                  60

Gly Lys Asp Leu Thr Phe Val Phe Asp Arg Val Phe Gly Glu Ala Ala
65                  70                  75                  80

Thr Gln Gln Asp Val Phe Gln His Thr Thr His Ser Val Leu Asp Ser
            85                  90                  95

Phe Leu Gln Gly Tyr Asn Cys Ser Val Phe Ala Tyr Gly Ala Thr Gly
            100                 105                 110

Ala Gly Lys Thr His Thr Met Leu Gly Arg Glu Gly Asp Pro Gly Ile
        115                 120                 125

Met Tyr Leu Thr Thr Val Glu Leu Tyr Arg Arg Leu Glu Ala Arg Gln
    130                 135                 140

Gln Glu Lys His Phe Glu Val Leu Ile Ser Tyr Gln Glu Val Tyr Asn
145                 150                 155                 160

Glu Gln Ile His Asp Leu Leu Glu Pro Lys Gly Pro Leu Ala Ile Arg
                165                 170                 175

Glu Asp Pro Asp Lys Gly Val Val Val Gln Gly Leu Ser Phe His Gln
            180                 185                 190

Pro Ala Ser Ala Glu Gln Leu Leu Glu Ile Leu Thr Arg Gly Asn Arg
        195                 200                 205

Asn Arg Thr Gln His Pro Thr Asp Ala Asn Ala Thr Ser Ser Arg Ser
    210                 215                 220

His Ala Ile Phe Gln Ile Phe Val Lys Gln Gln Asp Arg Val Pro Gly
225                 230                 235                 240

Leu Thr Gln Ala Val Gln Val Ala Lys Met Ser Leu Ile Asp Leu Ala
            245                 250                 255

Gly Ser Glu Arg Ala Ser Ser Thr His Ala Lys Gly Glu Arg Leu Arg
            260                 265                 270

Glu Gly Ala Asn Ile Asn Arg Ser Leu Leu Ala Leu Ile Asn Val Leu
        275                 280                 285

Asn Ala Leu Ala Asp Ala Lys Gly Arg Lys Thr His Val Pro Tyr Arg
    290                 295                 300

Asp Ser Lys Leu Thr Arg Leu Leu Lys Asp Ser Leu Gly Gly Asn Cys
305                 310                 315                 320
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Arg Thr Val Met Ile Ala Ala Ile Ser Pro Ser Ser Leu Thr Tyr Glu
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Asp Thr Tyr Asn Thr Leu Lys Tyr Ala Asp Arg Ala Lys Glu Ile Arg
            340             345             350

Leu Ser Leu Lys Ser Asn Val Thr Ser Leu Asp Cys His Ile Ser Gln
        355             360             365

Tyr Ala Thr Ile Cys Gln Gln Leu Gln Ala Glu Val Ala Ala Leu Arg
    370             375             380

Lys Lys Leu Gln Val Tyr Glu Gly Gly Gln Pro Pro Pro Gln Asp
385             390             395             400

Leu Pro Gly Ser Pro Lys Ser Gly Pro Pro Glu His Leu Pro Ser
            405             410             415

Ser Pro Leu Pro Pro His Pro Pro Ser Gln Pro Cys Thr Pro Glu Leu
            420             425             430

Pro Ala Gly Pro Arg Ala Leu Gln Glu Glu Ser Leu Gly Met Glu Ala
        435             440             445

Gln Val Glu Arg Ala Met Glu Gly Asn Ser Ser Asp Gln Glu Gln Ser
    450             455             460

Pro Glu Asp Glu Asp Glu Gly Pro Ala Glu Glu Val Pro Thr Gln Met
465             470             475             480

Pro Glu Gln Asn Pro Thr His Ala Leu Pro Glu Ser Pro Arg Leu Thr
            485             490             495

Leu Gln Pro Lys Pro Val Val Gly His Phe Ser Ala Arg Glu Leu Asp
            500             505             510

Gly Asp Arg Ser Lys Gln Leu Ala Leu Lys Val Leu Cys Val Ala Gln
        515             520             525

Arg Gln Tyr Ser Leu Leu Gln Ala Ala Asn Leu Leu Thr Pro Asp Met
    530             535             540

Ile Thr Glu Phe Glu Thr Leu Gln Gln Leu Val Gln Glu Glu Lys Ile
545             550             555             560

Glu Pro Gly Ala Glu Ala Leu Arg Thr Ser Gly Leu Ala Arg Gly Ala
            565             570             575

Pro Leu Ala Gln Glu Leu Cys Ser Glu Ser Ile Pro Val Pro Ser Pro
        580             585             590

Leu Cys Pro Glu Pro Pro Gly Tyr Thr Gly Pro Val Thr Arg Thr Met
        595             600             605

Ala Arg Arg Leu Ser Gly Pro Leu His Thr Leu Gly Ile Pro Pro Gly
    610             615             620

Pro Asn Cys Thr Pro Ala Gln Gly Ser Arg Trp Pro Met Glu Lys Lys
625             630             635             640
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Arg Arg Arg Pro Ser Ala Leu Glu Ala Asp Ser Pro Met Ala Ser Lys
                 645   650   655

Arg Gly Thr Lys Arg Gln Arg Gln Ser Phe Leu Pro Cys Leu Arg Arg
         660   665   670

Gly Ser Leu Pro Asp Thr Gln Pro Ser Gln Gly Pro Ser Thr Pro Lys
        675   680   685

Gly Glu Arg Ala Ser Ser Pro Cys His Ser Pro Arg Val Cys Pro Ala
   690   695   700

Thr Val Ile Lys Ser Arg Val Pro Leu Gly Pro Ser Ala Met Gln Asn
705   710   715   720

Cys Ser Thr Pro Leu Ala Leu Pro Thr Arg Asp Leu Asn Ala Thr Phe
         725   730   735

Asp Leu Ser Glu Glu Pro Pro Ser Lys Pro Ser Phe His Glu Cys Ile
        740   745   750

Gly Trp Asp Lys Ile Pro Gln Glu Leu Ser Arg Leu Asp Gln Pro Phe
        755   760   765

Ile Pro Arg Ala Pro Val Pro Leu Phe Thr Met Lys Gly Pro Lys Pro
   770   775   780

Thr Ser Ser Leu Pro Gly Thr Ser Ala Cys Lys Lys Lys Arg Val Ala
785   790   795   800

Ser Ser Ser Val Ser His Gly Arg Ser Arg Ile Ala Arg Leu Pro Ser
         805   810   815

Ser Thr Leu Lys Arg Pro Ala Gly Pro Leu Val Leu Pro Glu Leu Pro
        820   825   830

Leu Ser Pro Leu Cys Pro Ser Asn Arg Arg Asn Gly Lys Asp Leu Ile
        835   840   845

Arg Val Gly Arg Ala Leu Ser Ala Gly Asn Gly Val Thr Lys Val Ser
   850   855   860

<210> 3
<211> 1014
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HsKip3a
     fragment

<220>
<223> Nucleotide sequence encoding motor domain fragment
     of HsKip3a (Figure 2).

<400> 3
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<210> 4
<211> 338
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HsKip3a fragment.

<220>
<223> Amino acid sequence of the motor domain fragment
      of HsKip3a (Figure 3).

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Glu Leu Asp Ser Gln Arg Arg Pro Val Val Gln Val Val Asp Glu Arg
            20                  25                  30

Val Leu Val Phe Asn Pro Glu Glu Pro Asp Gly Gly Phe Pro Gly Leu
        35                  40                  45

Lys Trp Gly Gly Thr His Asp Gly Pro Lys Lys Gly Lys Asp Leu
    50                  55                  60

Thr Phe Val Phe Asp Arg Val Phe Gly Glu Ala Ala Thr Gln Gln Asp
65                  70                  75                  80

Val Phe Gln His Thr Thr His Ser Val Leu Asp Ser Phe Leu Gln Gly
                85                  90                  95

Tyr Asn Cys Ser Val Phe Ala Tyr Gly Ala Thr Gly Ala Gly Lys Thr
            100                 105                 110

His Thr Met Leu Gly Arg Glu Gly Asp Pro Gly Ile Met Tyr Leu Thr
            115                 120                 125

Thr Val Glu Leu Tyr Arg Arg Leu Glu Ala Arg Gln Gln Glu Lys His
        130                 135                 140

Phe Glu Val Leu Ile Ser Tyr Gln Glu Val Tyr Asn Glu Gln Ile His
145                 150                 155                 160
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Asp Leu Leu Glu Pro Lys Gly Pro Leu Ala Ile Arg Glu Asp Pro Asp
                165   170   175

Lys Gly Val Val Val Gln Gly Leu Ser Phe His Gln Pro Ala Ser Ala
            180   185   190

Glu Gln Leu Leu Glu Ile Leu Thr Arg Gly Asn Arg Asn Arg Thr Gln
        195   200   205

His Pro Thr Asp Ala Asn Ala Thr Ser Ser Arg Ser His Ala Ile Phe
    210   215   220

Gln Ile Phe Val Lys Gln Gln Asp Arg Val Pro Gly Leu Thr Gln Ala
225   230   235   240

Val Gln Val Ala Lys Met Ser Leu Ile Asp Leu Ala Gly Ser Glu Arg
            245   250   255

Ala Ser Ser Thr His Ala Lys Gly Glu Arg Leu Arg Glu Gly Ala Asn
            260   265   270

Ile Asn Arg Ser Leu Leu Ala Leu Ile Asn Val Leu Asn Ala Leu Ala
        275   280   285

Asp Ala Lys Gly Arg Lys Thr His Val Pro Tyr Arg Asp Ser Lys Leu
    290   295   300

Thr Arg Leu Leu Lys Asp Ser Leu Gly Gly Asn Cys Arg Thr Val Met
305   310   315   320

Ile Ala Ala Ile Ser Pro Ser Ser Leu Thr Tyr Glu Asp Thr Tyr Asn
            325   330   335

Thr Leu

<210> 5
<211> 383
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HsKip3a
      fragment

<220>
<223> Amino acid sequence of HsKip3a fragment used in
      the ATPase assay (Figure 4).

<400> 5
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  1   5   10   15

Pro Thr Pro Arg Glu Leu Asp Ser Gln Arg Arg Pro Val Val Gln Val
            20   25   30

Val Asp Glu Arg Val Leu Val Phe Asn Pro Glu Glu Pro Asp Gly Gly
        35   40   45

Phe Pro Gly Leu Lys Trp Gly Gly Thr His Asp Gly Pro Lys Lys Lys
   50   55   60

Gly Lys Asp Leu Thr Phe Val Phe Asp Arg Val Phe Gly Glu Ala Ala
   65   70   75   80

Thr Gln Gln Asp Val Phe Gln His Thr Thr His Ser Val Leu Asp Ser
            85   90   95

Phe Leu Gln Gly Tyr Asn Cys Ser Val Phe Ala Tyr Gly Ala Thr Gly
           100   105   110

Ala Gly Lys Thr His Thr Met Leu Gly Arg Glu Gly Asp Pro Gly Ile
       115   120   125

Met Tyr Leu Thr Thr Val Glu Leu Tyr Arg Arg Leu Glu Ala Arg Gln
    130   135   140

Gln Glu Lys His Phe Glu Val Leu Ile Ser Tyr Gln Glu Val Tyr Asn
145   150   155   160

Glu Gln Ile His Asp Leu Leu Glu Pro Lys Gly Pro Leu Ala Ile Arg
          165   170   175

Glu Asp Pro Asp Lys Gly Val Val Val Gln Gly Leu Ser Phe His Gln
          180   185   190

Pro Ala Ser Ala Glu Gln Leu Leu Glu Ile Leu Thr Arg Gly Asn Arg
       195   200   205

Asn Arg Thr Gln His Pro Thr Asp Ala Asn Ala Thr Ser Ser Arg Ser
    210   215   220

His Ala Ile Phe Gln Ile Phe Val Lys Gln Gln Asp Arg Val Pro Gly
225   230   235   240

Leu Thr Gln Ala Val Gln Val Ala Lys Met Ser Leu Ile Asp Leu Ala
          245   250   255

Gly Ser Glu Arg Ala Ser Ser Thr His Ala Lys Gly Glu Arg Leu Arg
          260   265   270

Glu Gly Ala Asn Ile Asn Arg Ser Leu Leu Ala Leu Ile Asn Val Leu
          275   280   285

Asn Ala Leu Ala Asp Ala Lys Gly Arg Lys Thr His Val Pro Tyr Arg
    290   295   300

Asp Ser Lys Leu Thr Arg Leu Leu Lys Asp Ser Leu Gly Gly Asn Cys
305   310   315   320

Arg Thr Val Met Ile Ala Ala Ile Ser Pro Ser Ser Leu Thr Tyr Glu
          325   330   335

Asp Thr Tyr Asn Thr Leu Lys Tyr Ala Asp Arg Ala Lys Glu Ile Arg
          340   345   350

Leu Lys Gly Asn Ser Lys Leu Glu Gly Lys Pro Ile Pro Asn Pro Leu
          355   360   365

Leu Gly Leu Asp Ser Thr Arg Thr Gly His His His His His His
     370   375   380

<210> 6
<211> 1152
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HsKip3a
      fragment

<220>
<223> Nucleotide sequence of HsKip3a fragment used in
      ATPase assay (Figure 5).

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aaccctgagg agcccgatgg agggttccct ggcctgaaat ggggtggcac ccatgatggc 180
cccaagaaga agggcaaaga cctgacgttt gtctttgacc gggtctttgg cgaggcggcc 240
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